USDA
NATURAL RESOURCES
CONSERVATION SERVICE

DELAWARE CONSERVATION
PRACTICE STANDARD

SURFACE DRAINAGE, FIELD DITCH

CODE 607
(Reported by Ft.)

DEFINITION

A graded ditch for collecting excess water in a field.

PURPOSES

Collect or intercept:

- Excess surface water, such as sheet flow from natural and graded land surfaces or channel flow from furrows, and carry it to an outlet;
- Excess subsurface water and carry it to an outlet.

CONDITIONS WHERE PRACTICE APPLIES

Applicable sites are flat or nearly flat and:

- Have soils that are slowly permeable (low permeability) or that are shallow over barriers such as rock or clay, which hold or prevent ready percolation of water to a deep stratum.
- Have surface depressions or barriers that trap rainfall.
- Have insufficient land slope for ready movement of runoff across the surface.
- Receive excess runoff or seepage from uplands.
- Require the removal of excess irrigation water.
- Require control of the water table.
- Have adequate outlets available for disposal of drainage water by gravity flow or pumping.

CONSIDERATIONS

When planning this practice the following items should be considered, as applicable:

- Potential impacts on downstream flows or aquifers that would affect other water uses or users.
- Potential water quality impacts for soluble pollutants, sediments and sediment-attached pollutants.
- Potential for uncovering or redistributing toxic materials.
- Effects on wetlands or water-related wildlife habitats.
- Effects of water lever control on soil water, downstream water temperature or salinity of soils.
- The need for riparian buffers, filter strips and fencing.
- Effects on water budget components, especially the relationships between runoff and infiltration.

This practice has the potential to affect National Register listed cultural resources or eligible (significant) cultural resources. These may include archeological, historic, or traditional cultural properties. Care should be taken to avoid adverse impacts to these resources.

Follow NRCS state policy for considering cultural resources during planning.

CRITERIA

Criteria Applicable to All Purposes

Drainage field ditches shall be planned as integral parts of a drainage system for the field served and shall collect and intercept water and carry it to an outlet with continuity and without ponding. Compliance with federal, state, and local laws and regulations is required.

Investigations. An adequate investigation shall be made of all sites.

Location. Ditches shall be established, insofar as topography and property boundaries permit, in straight or nearly straight courses. Random alignment may be used to follow depressions and isolated wet areas of irregular or undulating topography. Excessive cuts and the creation of small irregular fields shall be avoided.

On extensive areas of uniform topography, collection or interception ditches shall be installed as required for effective drainage.

Design. The size, depth, side slopes, and cross section area shall:

1. Be adequate to provide the required drainage for the site.

2. Permit free entry of water from adjacent land surfaces without causing excessive erosion.

3. Provide effective disposal or reuse of excess irrigation water (if applicable).

4. Conduct flow without causing excessive erosion.

5. Provide stable side slopes based on soil characteristics.

SPECIFICATIONS

Plans and specifications for field ditches shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

OPERATION AND MAINTENANCE

A site-specific operation and maintenance (O&M) plan shall be provided to and reviewed with the landowner(s) before the practice is installed.

The plan shall adequately guide the landowner(s) in the routine maintenance and operational needs of the ditch(es). The plan shall also include guidance on periodic inspections and post-storm inspections to detect and minimize damage to the ditch(es).

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Location the field ditch(es) on the conservation map.

2. Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom.

Field Data and Survey Notes

The following is a list of the minimum data needed:

1. Sketch of area, indicating field conditions, structures, size and location; side drainage, location and section; control points, etc.

2. Establish and describe a temporary benchmark.

3. Profile along centerline of ditch at 100-foot intervals.

4. Cross-sections. One per design reach not to exceed 500-foot intervals taken perpendicular to flow and extending 25 feet beyond the top of each bank.

5. Location and description of fallen trees and other debris that may need to be removed.

6. Soil investigation, auger logs to determine any special construction needs.

7. Low bank at each station (if needed for critical depth).

Design Data

Record on appropriate engineering paper. For guidance on the preparation of engineering plans see Chapter 5 of the Engineering Field Handbook - Part 650. The following is a list of the minimum required design data:

1. Plan view including job class, location map, utility notification, and construction specifications.

2. Design computations including the watershed map, drainage area, channel retardance, and design velocity and discharge.

3. Plan, cross-section and profile of ditch. Record design grade, bottom width, average depth, side slopes, hydraulic gradient, and berm width for each design section of the ditch.

4. Soil borings, where applicable.

5. Structures, where applicable.

6. Method of disposal for debris and for the spoil.

7. Vegetative plan. Include the seedbed preparation, seeding species and rate, lime, fertilizer and mulching requirements.

8. Provide for erosion protection at the ends of crossing pipes, as appropriate.

9. Provide for the control of erosion during and following construction. Construction sequence to include stream channel diversion and sediment control measures.

10. Show job class on the plan.

11. Estimated Quantities.

12. Written Operation and Maintenance Plan.

Construction Check Data/As-Built Plans

Record on survey notepaper, NRCS-ENG-28, or other appropriate engineering paper. Survey data will be plotted in red on the as-built plans. The following is a list of minimum data needed for As-built documentation:

1. Profile notes along centerline of the constructed ditch at 100-foot intervals.

2. Cross-section notes, one per design reach on the completed ditch or as needed to determine whether planned grade and dimensions have been met.

3. Location of spoil spreading and measurements to support special features installed.

4. Location, size, type, grade, and/or pertinent elevations of any structures used for stabilization.

5. Statement as to the condition or adequacy of vegetation on the banks, and other disturbed areas.

6. Final quantities and documentation for quantity changes. Materials certifications as appropriate.

7. Sign and date check-notes and plans by someone with appropriate approval authority. Include statement that practice meets or exceeds plans and NRCS practice standards.